

What is claimed is:

1. A semiconductor device, comprising:
a semiconductor substrate providing a semiconductor element ; and
5 a hard film which covers a part or the entirety of a side of the semiconductor substrate and which has top and bottom surfaces in approximately the same planes as those of the top and bottom surfaces of the semiconductor substrate, wherein the side of the semiconductor substrate
10 covered with the hard film is processed so as to be perpendicular or substantially perpendicular to the surface of the semiconductor substrate.
2. The device of claim 1, wherein the hard film provides a through hole and a through electrode is formed in the
15 through hole so that the through electrode has top and bottom surfaces which are in approximately the same planes as those of the top and bottom surfaces of the hard film.
3. The device of claim 1, wherein the semiconductor substrate is a silicon substrate.
- 20 4. The device of claim 1, wherein the hard film is a silicon oxide film or a silicon nitride film.
5. The device of claim 2, wherein the through electrode is formed of a high melting point metal.
6. A manufacturing method for a semiconductor device,
25 comprising the steps of:

(a) forming a recess in a semiconductor substrate, the semiconductor substrate having a semiconductor element, the recess being located in a region of the semiconductor substrate where the semiconductor element is not formed,
5 the recess is being perpendicular to a surface of the semiconductor substrate;

(b) filling the recess with a material of a hard film;

(c) adhering a support substrate to the surface of the semiconductor substrate, the surface includes the recess,
10 and making the bottom surface of the semiconductor substrate retrogress until a bottom surface of the hard film is exposed; and

(d) dividing the semiconductor substrate into pieces by cutting the hard film.

15 7. The manufacturing method for a semiconductor device according to claim 6, wherein in the step (b), filling the recess with a material of a hard film is followed by forming a through hole in the hard film and filling the through hole with a conductive material to form a through electrode.